

Review of nhess-2016-373

The comparative assessment of AMS and POT is interesting and nicely presented, but there are some basics that need to be clarified and possibly reconsidered.

Only one specific method for selecting an appropriate threshold for POT events has been applied. This choice might be crucial for the results and the conclusions, and it is not verified that the choice is optimal, although it is argued that some graphical criteria have been fulfilled. Another choice might lead to somewhat different conclusions.

The assessments are based on conditional root-mean-square deviation and conditional mean absolute error as metrics. With the condition applied ($T > 10$ yr) the number of observations available for calculation of the metrics is drastically reduced. For example, if the AMS sample is covering 30 yr, only the three largest observations are applicable for calculating the metrics; in a 50 yr sample only the five largest observations can be used. Taking into account that the variance of the order statistics is strongly increasing towards the upper end of the ordered sample, it is evident that the metrics become highly uncertain.

For assessment of empirical probabilities in the ordered sample the Weibull plotting position has been selected. While the choice of plotting position formula in many cases is of minor importance, it might be influential in the present case with overly weight on the upper order statistics. If F indicates a chosen probability distribution, and y_m is the m 'th order statistic in a sample of size N , then the Weibull plotting position stems from the fact that $E\{F(y_m)\} = m/(N+1)$. However, with M denoting the median operator, we have $F^{-1}(m/(N+1)) < M\{y_m\} < E\{y_m\}$. Thus $F^{-1}(m/(N+1))$ is relatively close to the modal value of y_m (where this exists), but far from being unbiased. A more balanced and consistent choice of plotting position would be the median plotting position as, independently of F , we have $M\{F(y_m)\} = F(M\{y_m\}) \approx (m-0.3)/(N+0.4)$.

There is a basic difference between calculation of the return periods in AMS and POT, which is important for $T < 10$ yr. For example, a 2 yr POT event corresponds to approximately a 2.54 yr AMS event, and a 5 yr POT event to a 5.52 AMS event. It is not evident how the difference between POT and AMS return periods has been handled.

Minor errors:

Page 7, line 21: The reference Makkonen (2005) is not in the reference list.

Page 20, line 2: insert "to" after "led".

Page 21, line 4: "where" -> "were"

Dan Rosbjerg